

REMARKS

Claims 2, 4, 5, 7 and 14-22 are pending in this application. Claims 2, 4, 5, 7, 14-18, and 20-22 are amended and claims 24-27 are added herein.

Claims 2, 4, 15, 17, 24 and 26 are independent.

Claim 17 is allowed. The preamble of claim 17 is amended herein solely for clarification.

Claims 2, 14-16, 19-20 and 22 stand rejected under 35 U.S.C. §102(e), as anticipated by Domi et al (U.S. Patent 6,319,461). Claims 4-5, 7, 18 and 21 stand rejected under 35 U.S.C. §103(a), as obvious over Kenji et al. (referred to as PA) in view of Domi. The rejections are respectfully traversed on the basis of the arguments presented below, as well as those that were previously presented in response to prior Official Actions rejecting the same claims on the same grounds and that are incorporated herein by reference.

It is respectfully submitted that the interpretation of Domi, as asserted in the Official Action to which this response relates, is in error. More particularly, the Official Action asserts that Domi, in col.2, lines 23-24 and 49-52, discloses that the solder alloy does not include titanium (see present Official Action, in the "Note" bridging pages 2-3, and in the "Response to Arguments" on page 5).

However, as discussed in detail in the above referenced previously presented arguments, Domi, in col.2, lines 1-4, explicitly discloses that the solder alloy contains Ti, as an essential constituent.

Furthermore, Domi, in col.2, lines 33-35, and in column 2, line 62, through column 3, line 7, discloses that the solder alloy always includes titanium. Indeed, Domi, in col.2, lines 11-12, states that "A lead-free solder alloy of this invention is characterized by containing Sn and Ti" (emphasis added). It is in this context that

Domi, in col.2, lines 23-24, states “The lead-free solder alloy of the present invention preferably contains at least 0.0001% by weight O” (emphasis added). Thus, when interpreted in context, there can be no doubt that the lead-free solder alloy of Domi always includes titanium. This is still further evidenced by Domi, in col.6, lines 32-34, and Table 2, where it is taught that the solder alloy without Ti is “out of the scope of the present invention”.

Therefore, claims 2, 14-16, 19-20 and 22 are not and cannot be anticipated by Domi, since Domi requires the addition of titanium (Ti), which is excluded from the presently claimed invention.

Kenji, which is cited only for its disclosure of a connection lead (and not for disclosing the required composition), does not cure the defect in Domi. Thus, claims 4-5, 7, 18 and 21 are also unobvious over Kenji in view of Domi,

Accordingly, it is respectfully submitted that each of the rejected pending claims recited patentable subject matter prior to amendment herein. Thus, it should be understood that the amendments made herein are solely for the purpose of clarification and not for purposes of patentability.

To even further distinguish over the applied prior art, and avoid further delay in allowance, claims 2, 4 and 15 are amended herein to recite that “said alloy composition (or said plating) is capable of soldering a metallic material with no oxide film on its surface”.

This limitation is supported by the disclosure on page 11, lines 17-21, and page 12, lines 2-4, of the present specification (see also Figure 2A). As taught therein, the alloy composition (i.e., plating 12 and plating 13) and the plating (i.e., plating 12) are used to solder to a metallic material (i.e., a copper strip 11 in the

former case, and a silver-plated portion 16 in the latter case) with no oxide film on its surface. Accordingly, no new matter is added.

It is respectfully submitted that this limitation further distinguishes independent claims 2, 4 and 15 over Domi (and therefore also the applied combination of Kenji in view of Domi). More specifically, Domi discloses a solder alloy used to solder oxide materials and metals (e.g., titanium) with oxide film on their surface (see Domi, col.4, lines 31-35).

New independent claim 24 requires that an alloy composition, containing 0.002 to 0.015% by mass of phosphorus with the balance consisting of tin, be capable of generating on its surface an oxide film with a thickness of less than 6 μm in a range of 250 to 350 degrees centigrade.

New claim 24 is supported by the disclosure on page 15, beginning after line 19, through page 16, line 15, and FIG.5 of the present application. Accordingly, no new matter is added.

It is respectfully submitted that Domi lacks any suggestion of an alloy composition capable of generating an oxide film on its surface having a thickness of less than 6 μm in a range of 250 to 350 degrees centigrade. Additionally, as discussed above, Domi discloses a solder alloy used to solder oxide materials and metals (e.g., titanium) with oxide film on their surfaces (see Domi, col.4, lines 31-35). Hence, Domi has no need for an alloy composition capable of generating an oxide film on its surface, as claimed.

Thus, new claim 24 distinguishes over Domi (and therefore also the applied combination of Kenji in view of Domi).

New claim 25, which depends from claim 24, requires that the alloy composition be bismuth, antimony, gallium and titanium free. For reasons that are

believed to be clear from the above, it is respectfully submitted that claim 25 is further distinguishable over the applied prior art.

New independent claim 26 requires a lead-free solder having an alloy composition which contains 0.002 to 0.015% by mass of phosphorus with a balance consisting of tin, and which is bismuth, antimony, gallium and titanium free. For reasons that are believed to be clear from the above, it is respectfully submitted that claim 26 distinguishes over the applied prior art.

New claim 27, which depends from claim 26, requires that the alloy composition be capable of generating an oxide film on its surface with a thickness of less than 6 μm in a range of 250 to 350 degrees centigrade. For reasons that are believed to be clear from the above, it is respectfully submitted that claim 27 is further distinguishable over the applied prior art.

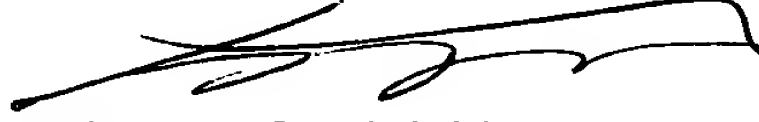
In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed local telephone number, in order to expedite resolution of any remaining issues and further to expedite passage of the application to issue, if any further comments, questions, or suggestions arise in connection with the application.

To the extent necessary, applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage of fees due in connection with the filing

Docket No. 3008-0028
File No. 521.41457X00
Client No. PHCF-01094

of this paper, including extension of time fees, to the Deposit Account No. 01-2135
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